PEARSON[7] has been studying the morphology of *Gnetum*, and has recorded some interesting observations. He finds four types of strobili in *G. Gnemon*, which constitute a sequence from the strictly monosporangiate to the bisporangiate condition. He also finds that the endosperm develops in many details as that of *Welwitschia*, especially in the multinucleate character of the primitive tissue. The nuclei in each "compartment" in the chalazal region fuse; while in the micropylar region there is no septation. It seems, therefore, that the primary endosperm of the two genera is alike in all respects. PEARSON sees in this endosperm a new structure which is neither sporophyte nor gametophyte, but which he designates as "trophophyte," and it is further suggested that the endosperm of angiosperms is a highly specialized form of this trophophyte. The interesting suggestion is made that the fusing polar nuclei of angiosperms may be morphologically the representatives of the fusing nuclei of *Welwitschia* and *Gnetum*.

BOODLE[8] has discovered concrescent leaves on a tree of *Pinus Laricio* growing in the Royal Botanical Gardens, Kew. These leaves are produced every year in considerable numbers. It is suggested that the double needles of *Sciadopitys* may be morphologically similar to those of *P. Laricio*, that is, they may represent two foliage leaves fused by their margins. The orientation of the leaves of the double needles of the Austrian pine, however, is not constant, cases being found with fusion by the adaxial margins, by the abaxial margins, and by obliquely placed leaves.—J. M. C.

Endemic flora of Ceylon.—In connection with the revision of his catalogue of the Ceylon flora, WILLIS[9] has reached some interesting conclusions in reference to geographical distribution and evolution. The conclusions are derived from the use of statistical methods and the classification of the Ceylon species into a series of six groups, graded from "very rare" to "very common." He observes that the rarest plants are local endemics, and the commonest are those of widest distribution. The conclusion is that "local endemic species have not been developed in any kind of advantageous response to local conditions." That the endemic genera should show greater rarity than do the endemic species as a whole cannot be explained by any such theory of adaptation. Graphically WILLIS' observations would "run in the exact reverse direction all through to that demanded by the theory of natural selection." A second conclusion is that on the average the commonness of the species depends upon its age locally, species developing "quite indifferently to local conditions, though possibly because of those conditions."

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[7] PEARSON, H. H. W., Notes on the morphology of certain structures concerned in reproduction in the genus *Gnetum*. Jour. Linn. Soc. **43**:55–56. 1915.

[8] BOODLE, L. A., Concrescent and solitary foliage leaves in *Pinus*. New Phytol. **14**:19–22. *figs.* 4. 1915.

[9] WILLIS, J. C., The endemic flora of Ceylon, with reference to geographical distribution and evolution in general. Phil. Trans. Roy. Soc. London B **206**:307–342. 1915.

WILLIS suggests that all Ceylon species have arisen as single mutations, and that subgenera and genera may arise similarly. Some of the endemics of Ceylon, which are and always have been very restricted, would indicate that the same mutation need not go on appearing in order to become established. However well a species may be locally adapted, it will be in great danger of extermination until it has gotten beyond the degree of commonness represented by "very rare." "Having reached the maximum height [in the scale of commonness] that it is going to reach, a species will ultimately descend, and will sooner or later become extinct, though there is no evidence that as yet many or any species are on the downward road." The statistical facts brought out "support very strongly the hypothesis that the whole tree of descent of a family may exist on the earth at the present moment, and that the area occupied is in general an indication of the age of a species or a genus, if it has not already attained its maximum."—MERLE C. COULTER.

The mosaic disease of tobacco.—ALLARD[10] has given an account of the mosaic disease of tobacco that will be of much interest to all who desire to become acquainted with the chief features of this interesting and destructive disease. The most characteristic external feature of the disease is a mottling of the leaf, due to partial chlorosis. The disease is communicable to a number of the Solanaceae, but appears to be distinct from the very similar mosaic disease of *Phytolacca*. The mosaic virus permeates all parts of the plant, but does not infect the embryo; hence seeds of diseased plants produce healthy individuals. The disease seems to be incurable and no plants of susceptible species seem to be immune. The origin and distribution of the disease are mysterious, and the author's experiments lead him to oppose the more commonly current theory that the disease is associated with unbalanced enzymatic activities and physiological toxins. ALLARD thinks that the disease is parasitic and that it is communicated from plant to plant by certain aphids. No organisms that might be responsible for the disease have yet been isolated. This disease seems to have the characteristics of infectious chlorosis, as described by BAUR.

Further studies of the mosaic disease, also by ALLARD,[11, 12] have to do with interesting special features. It is found that the dilution of the virus to 1 part in 1000 results in no impairment of infection, though dilution to 1 part in 10,000 results in an effective attenuation of the virus activity. While the

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[10] ALLARD, H. A., The mosaic disease of tobacco. U.S. Bureau of Plant Industry, Bull. 40. pp. 33. *pls.* 7. 1914.

[11] ———, Effect of dilution upon the infectivity of the virus of the mosaic disease of tobacco. Jour. Agric. Research 3:295–299. 1915.

[12] ———, Distribution of the virus of the mosaic disease in capsules, filaments, anthers, and pistils of affected tobacco plants. Jour. Agric. Research 5:251–255. *pl.* 1. 1915.